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Political Instability as an impediment of FDI. Case of the South Caucasus Region.

Master's thesis

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Allowed for defence on ……..
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I have written this master's thesis independently. All viewpoints of other authors, literary sources and data from elsewhere used for writing this paper have been referenced.

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Abstract

This paper assesses the relationship between affiliate firms' perception of political instability and their headquarters' investment decision in the South Caucasus region. Results based on the BEEPS (Business Environment and Enterprise Performance Survey) data suggest that the perception of political instability does not have a significant effect on the company's decision to invest or not (propensity of FDI) in this region. On the other hand, headquarters which have already made an investment prefer to reduce the volume of FDI (intensity of FDI) if their affiliate firms face the problem of political instability. This negative effect disappears when firms perceive high corruption together with political instability. Presence of oil resources is a significant determinant of FDI in the South Caucasus region but there is no significant difference between non-oil and oil industries in case of sensitivity to political instability.

1.Introduction

Broadening linkages of national economies into a worldwide market of goods, services and especially capital is one of the key features of globalization. Growth of Foreign Direct Investment (FDI) is the most visible consequence of this process. On the other hand, FDI as a source of economic growth for transition countries seems to have recently attained the status of a stylized fact. Under certain conditions, FDI is the most desirable form of capital inflow in the developing countries. Compared to short–term credits and portfolio investments, FDI is more stable in terms of changes in political economic environment.

Higher foreign investments may accelerate country's economic performance through accumulation of more human and physical capital. Foreign direct investment as an additional source of investment might be more beneficial than domestic saving for the host economy because its spillover effect/positive externalities (Markusen and Venables (1999), Görg and Greenaway (2003), Javorcik (2004)). Higher FDI associates with technology and knowledge transfer from home to host country (Lipsey (2002), Blomström and Kokko (2003)). Furthermore, higher investment and economic growth positively affect country's socio-political stability. Stable political environment is the source of another investment (Alesina and Perotti (1996)). While the positive FDI-growth relationship is not unambiguously accepted, positive role of FDI is still supported, especially in particular circumstances, when the host country is abundant in high qualified human capital (Blomström et al. (1994)), Borensztein et al. (1998)) or financial system is well developed (Alfaro et al. (2004)).

Positive interdependence between FDI and economic performance arises the following important question: what can countries do to attract more FDI? Many studies suggest various factors that influence location choice of investment by multinational enterprises (MNEs). Some of them are firm-level characteristics and others are country-level factors. For example, Helpman, Melitz and

Yeaple (2003) concluded that relative productivity is a crucial factor which determines MNEs' investment decision. On the other hand, using cross-sectional data on outward FDI from the U.S, Yeaple (2009) confirmed that countries with better investment environment attract more U.S MNEs.

This paper focuses on the host country characteristics, in particular on political instability as an impediment of FDI in the South Caucasus region. The South Caucasus is a strategically located region, on the border of Europe and Asia, with heterogeneous countries (Georgia, Armenia and Azerbaijan). Region has all possibilities, such as oil resourses, cheap labor force, good location to become a hub of investment in SEE (South East Europe) region. Political stability still remains as a main obstacle for foreign investors (Nuriyev (2008), Kakachia (2009)). This makes it a good case for identifying the role of political stability in attracting FDI.

Despite the growing literature about the key aspects of FDI in transition countries, such as: origin, incentives, forms, destination by economic sectors and determinants of FDI (Bevan et al. (2004), Bevan and Estrin (2004)), there is a gap in FDI literature in the case of the South Caucasus region. Studies which already exist mostly concentrate on the characteristics of one particular country (McGee (1999) – Armenia, Gulbrandsen and Moe (2007) – Azerbaijan, Cukrowski (2009) - Georgia) not the overall business environment in the region. This paper will be a forward step to investigate the business climate in the South Caucasus region, concentrating on political instability. Study of political instability in regional context is also justified because political instability in a host country not only affects its own investment climate but there is an obvious spatial dependence which means that political risk in one country has significant negative effect on FDI in this region (Ades and Chua (1997), Estrin and Uvalic (2014)).

On the other hand, the analysis of the consequences of political instability has been a central theme in recent macroeconomic research (Barro (1991) – economic growth, Roubini (1991) – budget deficit, Cukierman et al. (1992) - seniorage, Collins (1996) – exchange rate). However, the effect of political instability on FDI has been studied to lesser extent than several other determinants of FDI (Eaton and Tamura (1994) – gravity model, Head et al. (1995) – agglomeration effect, Carr et al. (2001) and Bergstrand and Egger (2007) – human and physical capital model).

Previous papers that concentrate on the effect of political stability on FDI (Alesina and Perotti (1996), Campos and Nugent (2003), Brada et al. (2006), Estrin and Uvalic (2014)) simply view political instability in terms of an event occurring. For example, number of revolutions, coups and assassinations. But most managers' understanding of the concept of political risk, their assessment and evaluation of politics, and the manner in which they integrate political information into decision making are all rather general, subjective, and superficial[1]. Main contribution of this paper is not just filling the research gap of FDI literature in the South Caucasus region, but also analyzing business environment based on the perceptions data. Despite skepticism among economists about

[1] Kobrin (1979).

reliability of subjective perception data (Bertrand and Mullainathan (2001), Gelb et al. (2007)), it has been used in various studies across disciplines and provides useful information (Javorcik and Spatareanu (2005), Pierre and Scarpetta (2006)).

To assess the effect of political instability on firm's investment decision this paper uses data from Business Environment and Enterprise Performance Survey 2009 (BEEPS)[2]. We have to point out that we observe affiliate's perception about business climate but investment decision is made by headquarter taking into account this perception. The dissertation concludes that perception of political instability significantly deters intensity of FDI, but does no play a significant role in case of the propensity of FDI. Furthermore, non-exporting foreign firms are more sensitive to political instability than exporting ones. Oil resource is significant determinant of FDI but there is no difference between non-oil and oil industries in case of sensitivity to political instability.

In general, FDI is a forward looking decision meaning that not only one obstacle but different obstacles together may play a significant role. Checking the complementarity between obstacles in case of propensity/intensity of FDI shows that there is a lack of complementarity between perception of political instability and corruption means that high perception of political instability compensates the negative effect of corruption.

This paper is organized as follow. Section 2 is literature review. Section 3 describes the investment climate in the South Caucasus region. Section 4 explains data and model. Section 5 presents empirical results. Section 6 checks the complementarity between obstacles. The last section concludes.

2.Literature review

2.1.Determinants of FDI

At some stage companies make the decision about extending their activities abroad. There are several methods of accessing to foreign market; one is making direct investment in the host country means that an investor from one country makes a long-term financial participation in an enterprise in the other country with significant degree of influence on the management of the enterprise (at least 10% share of capital plus technology and know-how transfer indicating a "significant" degree of influence)[3].

[2] In case of Georgia survey period coincides with armed conflict with Russia in 2008. This might affect the perceptions and also final result. Petracco and Schweiger (2010) checked the differences between perceptions before and after the war based on dif-dif method and concluded that the effect of war on the perception of political instability is not significant.

[3] International Monetary Fund (IMF), Organization for Economic Cooperation and Development (OECD) and United Nations Conference on Trade and Development (UNCTAD).

Investing in another country has some benefits but also costs. When advantages are assumed to be higher than the expected risks, investment decision is justified. According to the "OLI" paradigm (Dunning (1993)) the decision of making foreign investment is based on the three types of advantages: Ownership (O), Locational (L) and Internalization (I).

Ownership advantages also known as Firm Specific Advantages (FSAs) (Rugman (1984)) contain reputation, brand name, know-how and other non-intangible assets, such as patents, technology which only belongs to foreign firm. These FSAs enable the firm to cover the added costs of operating in a foreign country.

Only certain types of firms are able to use ownership advantages through internalization (I). Internalization theory (Buckley and Casson (1998b), (2009)) explains the practice of multinational enterprises (MNEs) to execute transactions within their organization rather than relying on an arm's length transactions (market transactions). Internalization prevents other firms to copy the foreign firm's technology to maintain the monopoly power. When the firm is not able to internalize the whole production process abroad it chooses licensing to enter to the foreign market.

These two advantages are mostly location-independent and closely connected to firms' motives to invest abroad. Locational (L) advantage determines the attractiveness of the host country. Within the trinity of conditions for FDI to occur, locational determinants are the only ones that host governments can influence directly. This is the reason why countries try to cut their taxes, create free economic zones, reduce the trade and investment barriers and create investment opportunities for foreign investors.

Locational specific determinants can be grouped into three broad categories[4]:

- *Policy framework for FDI:*

Without attractive foreign investment legislation no FDI will take place in a host country. In general, foreign liberalization policy, such as free trade agreements and openness to foreign capital are supportive to FDI inflow (Tuman and Morris (1998)). Political factors of the OLI model also emphasize the importance of the host country's political environment (Haggard (1988)). Some political instability models claim that firms reject countries because of their political instability (Howell and Chadwick (1994)). For instance, revolutionary movements may threaten the security of multinational firms. As a result, companies can avoid investing in countries that are experiencing revolutionary movements (Frey (1985), Asiedu (2002)).

- *Economic determinants for FDI.*

There are four classical economic location-specific determinants for FDI (Dunning, 1993):

- *Market-seeking (horizontal) FDI.* Countries with huge markets and high growth potential are the main destinations for foreign capital (Markusen (1984), Helpman (1984)). The

[4] World Investment Report: Trends and Determinants (1998).

market seeking factor explains why huge volume of FDI flows go to China and India. In the last decade, FDI in China increased by 7 times, while in India by 5 times[5].

- *Efficiency-seeking (vertical) FDI* takes place when a firm wants to minimize its production cost and splits the value chain process between different countries (Baltagi et al. (2005)).
- *Resource seeking FDI* is closely related to efficiency seeking FDI. Interdependence comes from the fact that when country has abundant natural resources it makes this factor cheaper. Efficiency and resource seeking factors are assumed as a motivation of investment in transition countries (Campos and Kinoshita (2003)).
- *Asset seeking FDI* is the fastest growing motive of FDI between these four motives and contains patents, brands and other tangible and intangible assets. This type of FDI is leading in case of Azerbaijan due to its strategic asset, oil. According to IMF estimates, between 75% and 82% of total FDI in Azerbaijan is in oil and gas industry. Besides, 30% of investment invested in other parts of economy is related to investments in oil and gas industry (Tondel (2001)).

Transition process is always related to high level of privatization as a way to change the market structure and approach market economy. As a result, foreign investors can buy strategic assets with affordable prices, due to supportive tax policy and sometimes subsides to foreign investors (Perotti et al. (2001)).

- *Business facilitation of FDI*.

Business promotion, after-investment services and other measures that facilitate business transactions improve business environment and attract foreign investors. Financial or fiscal incentives are also used to encourage investments. These incentives work only when other important economic determinants are in place (Blomström and Kokko (2002)).

Another approach to analyze FDI inflows is gravity method which suggests that main drivers of trade/foreign investment flows are:

- Market size of the host economy; this type of motive is similar to market seeking FDI.
- Market size of the source economy;
- Distance between host and source countries (Klienert and Toubal (2010)).

An important result of these models is that factor endowments matter significantly for FDI patterns. In addition to the traditional gravity variables, such as tradeoff between trade and FDI (proxied by distance between countries) and home and host market sizes (proxied by GDP) contemporary literature additionally considers:

[5] World Bank. World Development Indicators.

- Membership of international trade and economic associations; for example, the effect of announcement of association with European Union (EU) membership (Bevan and Estrin (2004));
- Agglomeration effect. For instance, location of other Japanese firms in US state affects subsequent FDI for a Japanese MNE. (Head et al. (1995)).
- Corruption. Variety of corruption indices are strongly and negatively correlated with FDI (Hines (1995), Wei (2000)).
- Political stability. In the case of Balkan countries, conflict and instability reduce FDI inflows (Brada et al. (2006)).

To conclude, analyzing locational determinants of FDI through political factors of the OLI model is a new approach and it emphasizes on how political instability might deter FDI inflows in the country.

2.2.Political instability and FDI

Foreign direct investment is a forward-looking activity and has long-lasting results means that the decision about investing is not static but dynamic process taking into consideration host country's future perspectives. So, foreign investors are sensitive to political factors which are closely connected to economic volatility (Wei (2000), Aseidu (2005)).

Political instability hinders economic development through its effect on the accumulation of physical and human capital (Alesina et al. (2005)). Foreign direct investments are often difficult to reverse means that investors can postpone new capital projects until the clarification of policy environment. Political risk remains one of the main obstacles for foreign investment in emerging markets and it is likely to continue being so over the medium term[6].

This part of the dissertation aims to explain the existing literature which explain how political instability affects FDI inflow. There is almost no literature available which explains the impact of political instability on FDI in the South Caucasus region. The lack of literature motivates the analysis in this dissertation.

Before 1980s most studies were concentrated on either only economic or political factors instead of checking their joint significance. Frey and Schneider (1985) were first who test the explanatory power of the following four types of models: a) models that concentrate exclusively on political determinants, such as, political instability; b) models that concentrate exclusively on economic determinants, such as, GDP growth, inflation, balance of payment, wage cost, skilled labor force; c) model that uses as the sole determinant an international risk indicator, an amalgamation of economic and political factors and d) Politico-economic model that simultaneously includes

[6] World Investment and Political Risk (2009).

political and economic determinants. They concluded that foreign direct investment in developing countries is simultaneously determined by economic and political factors.

When we know that political instability together with economic variables determine FDI flows, the next step is to identify the channels and direction of relationship between political instability and investment.

There is a well-developed literature that examines the relationship between host country political instability and FDI inflow. Alesina and Perotti (1996) investigated the link between income distribution and investment through political instability and showed that political instability had a negative effect on investment in a sample of 70 countries from 1960 to 1985. Based on the data of reported manufacturing plants openings from 1984 to 1987, Woodward and Rolfe (1993) found that political stability increases the attractiveness of a country to be selected as an investment location. Globerman and Shapiro (2002) created a two stage analysis of FDI inflows, based on the data of US MNEs to 143 countries during 1994 – 1997. First stage investigated the causal factors that a country is a FDI recipient or not while the second stage examined the determinants of the amount of FDI. They concluded that an index of political instability did not influence the attractiveness of the country, but reduced the amount of FDI inflow to a country.

Li (2006) tried to explain how political violence, an extreme form of political instability, affected foreign direct investment. Schneider and Frey (1985) found that political instability had a negative effect on FDI flows. Using a cross sectional data of FDI inflows in 36 countries for only two years 1977 and 1982, Loree and Guisinger (1995) showed that political stability significantly promotes FDI inflows in 1982, but not in 1977. Busse and Hefeker (2007), using data sample of 83 developing countries between 1984 and 2003, concluded that government stability, the absence of internal and external conflicts are significant determinants of foreign investment inflows. Meon and Sekkat (2008) raised the issue that the sensitivity of foreign investors to political risk in a particular country depends on global FDI flows at a given point in time; when FDI is booming, investors are less sensitive to political risk.

Brada et al. (2006) studied the impact of transition and political instability in case of Central Europe, the Baltics and the Balkans. This paper concluded that in the case of Balkan countries, conflict and instability reduced FDI inflow. Balkan region is more deeply analyzed in Estrin and Uvalic (2014) paper. This paper explored the determinants of foreign direct investment into eight transition economies in Southeast Europe (SEE) and concluded that FDI to the Balkans are driven by geographical and institutional factors, similarly to other transition economies, but there is evidence of a significant negative regional effect because of politically unstable environment.

Political instability also has indirect effect on investment through economic growth (market seeking FDI). For example, Barro (1991) found that political instability negatively affects economic growth and investment. He found that measures of political instability, such as coups, revolutions, and political assassinations, are inversely correlated with the growth of GDP and investment share of the GDP. Alesina et al. (1996), based on data of 113 countries from 1950 till

1982, concluded that in countries with a high propensity of government collapse, growth is significantly lower than otherwise. Alesina and Tabellini (1989), Ozler and Tabellini (1991), Cukierman et al. (1992) made the similar conclusion that political instability leads to weaker economic performance.

Political instability in the host country not only affects its own investment climate but there is an obvious spatial dependence which means that political risk in one country has significant negative effect of FDI in this region. Ades and Chua (1997) based on the data of 118 countries over the sample period 1960 to 1985, examined the effect of political instability on regional investment potential. The result shows that regional instability has a significant negative effect on economic growth.

The effect of political stability on investment and economic growth is not an unambiguous one. Campos and Nugent (2003), based on the data from 1960 till 1995 from 98 developing countries, found no evidence of the hypothesized negative and causal relationship between political instability and economic growth. Similar conclusion is reached by Bennett and Green (1972) but in more specific case, based on data from marketing. They explored the difference between theory and reality. For instance, international marketers say that political instability is important to their investment decisions but their actions do not confirm this. Another study, by Olibe and Crumbley (1997) did not find significant evidence that a political risk influences U.S. FDI flows to 10 out of 13 OPEC countries. Li and Resnick (2003) showed that political instability does not have a significant effect on FDI, yet "regime durability" encourages such investment. Wheeler and Mody (1992) reported that political risk has an insignificant effect on United States MNE location decisions. Similar results were reported by Asiedu (2002) and Bevan and Estrin (2004) on different subgroups of countries. In a pooled data of 52 developing countries between 1982 and 1995, Sethi et al. (2003) found that political instability did not influence U.S. FDI flows to 28 countries between 1981 and 2000.

Political instability is an obstacle not only for foreign investors but also has significant negative effect on domestic saving and capital outflows. As we mentioned above agglomeration effect plays a crucial role for foreign investors when they make a decision of investment (Du et al. 2008). Alesina and Tabellini (1989), using general equilibrium model in the case of developing countries, provide an explanation why political instability causes private capital outflows and relatively low domestic capital formation in developing countries.

Similarly, Ketkar and Ketkar (1989) investigated the determinants of capital flight from Argentina, Brazil and Mexico and found that political risk was an important factor in all three countries. Levine and Renelt (1992) concluded that number of revolutions and coups per year is negative correlated with the investment share of gross domestic product. Bailey and Chung (1995) studied the impact of political risk on the Mexican stock market and found a significant link between political risk and the equity premium. Kutan and Perez (2002) examined the significance of socio-

political instability and organized crime in Colombia on that country's stock market prices and found a significant connection.

Other channel how political instability affects FDI inflows in the host country is through physical and human capital accumulation. Efficiency and market seeking determinants of FDI are leading in case of the South Caucasus region (cheap labor force in Georgia and Armenia and huge resources in Azerbaijan). Based on cross-country data and use of Cobb-Douglas production function, Benhabib and Spiegel (1992) concluded that presence of human capital makes countries more attractive, while political instability may deter it.

Above we reviewed the studies which are mostly concentrate on the direct effect of political instability on FDI. On its own political instability is an important part of institutional development. Furthermore, political stability mostly determines the stability of the whole institutional system. Thus, it is interesting to check the joint effects of political instability interaction with other factors of institutional development on business environment. Campante et al. (2009) assessed U-shaped relationship between political stability and corruption. Such non-monotonic relationship comes from the two effects: horizon effect and demand effect. The idea of horizon effect is related to the fact that lower level of stability reduces the existing government's decision-making horizon, which lead to more corruption (steal more today instead of accumulate resources for the future). This horizon effect can be assumed as a supply side of this relationship (decreasing part of U shape curve). On the other hand, private sector is more willing to pay bribes in case of stable government – demand effect (increasing part of U shape curve). Moreover, Fredriksson and Svensson (2002) developed a theory of environmental policy formation, taking into account the degree of corruption and political instability. They figured out that effects of political instability and corruption on policy formation are interdependent. Further, political instability has a negative effect on the stringency of environmental policy when corruption is low, but this negative effect vanishes when corruption is high.

To conclude, there are different channels how political instability might affect foreign direct investment but the relationship is not always obvious. The crucial point based on literature review is that political instability is not only country level characteristic but it also has negative influence on the whole region. This argument supports our sampling to study the impact of political instability not only on a specific country but analyses it in regional context. On the other hand, we have to analyze not only the direct effect of political instability on business climate but interaction with other institutional factors.

2.3.Measure of political instability

Although there is an increasing academic interest in the intersection of politics and international business, the definition of "political instability/risk" is limited. In most cases political instability is associated to government interference with business operations, such as: change the terms of agreements, confiscation of wholly/partially foreign owned business property (Weston and Sorge (1972), Aliber (1975)).

Political instability can be viewed in two ways. The first one is concentrated on executive instability. The second one is linked to social unrest. Based on the first approach political instability is defined as a "propensity to observe government changes" which can be constitutional or unconstitutional (Alesina and Perroti (1996)). It should be noted that a propensity of government changes and real government changes are two different indicators. The second approach of measuring political instability is based on the construction of an index which summarizes different variables of social unrest (Hibbs (1973), Barro (1991), Ozler and Tabellini (1991)). It is not obvious which of two measures is preferable. Both indices measure political instability in terms of an event occurring not environment in which firms make a decision. The limitation of such measures is highlighted in Robock's (1971) definition that political environments are dynamic which means that gradual and progressive changes neither expected nor unexpected are not associated with political risk.

In reality, the decision of FDI is made by managers' based on the concept of political risk, their assessment and evaluation of politics which is so subjective and superficial (Kobrin (1979)). Instability is a feature of the environment. The study makes it clear that obstacles to investment exist in the mind of the investors[7]. So, using perception data to measure political instability is a significant advantage.

There is no clear relationship between political risk variables and FDI based on econometric studies, but findings based on perception data support the view that MNEs take into account political risk in their investment decisions. Early studies (Aharoni (1966), Bass et al. (1977) showed that political stability is a significant factor in investment decisions. The similar conclusion is reached by Agtmael (1976) that typical response to political risk is to avoid it by investing in more stable country.

Nowadays, there is growing evidence that political risk not only influence investment decisions, but is also reflected in various business surveys. An Economist Intelligence Unit survey of 602 investors (2007) found that companies expected political risk to become a much greater problem for investments in the future than in the recent past, especially in emerging markets[8]. A survey by Ernst & Young assumed political risk as a main investment obstacle for companies in developed

[7] National Industrial Conference Board. Obstacles and Incentives to Private Foreign Investment, 1967-68, Volume I: Obstacles. NY: National Industrial Conference Board, 1969.
[8] World Investment Prospects to 2011 (2007).

countries (Ernst & Young, 2007). Based on survey data, Grant Thornton (2008) found that stability which includes both political and economic stability are equally important with market size and growth potential when determining FDI location.

In this dissertation we use the perception of political instability by foreign affiliate firms which covers all aspects of political environment which interrupt current operation of the company. So we follow the idea that managers' of headquarters get the information about political environment from the host country employees (Zink (1973), Keegan (1974)).

3.Investment Climate in South Caucasus region

The transition process in the South Caucasus region proceed differently, rather than in Baltic Region and other CEE countries. The most difficult was the early stage because of weak institutional capacity, poor economic heritage, wide bureaucracy and high corruption which cause the conflicts and political instability. As a result, the region failed to create incentives for investments (Hübner (2011)). However, after mid 1990s the countries of South Caucasus region: Georgia, Armenia and Azerbaijan started stabilization policies but different processes took place in these countries and nowadays the following reality we have**.** Oil industry is leading force of Azerbaijan economy but country still has problems regarding corruption and trade barriers which deteriorate business environment. Countries, such as Georgia and Armenia with limited resources create flexible business climate to attract more FDI.

Azebaijan

Azebaijan attracts majority of foreign investment in this region (68% of total foreign direct investment in the South Caucasus region)[9] because of oil industry. Huge success of Azerbaijan in attracting investments in the oil sector is not as visible as in case of non-oil sector. There are several reasons for the limited investment attractiveness outside oil sector. Azerbaijan is assumed as an autocratic system with high corruption, huge informal market, sector monopolies and entry barriers together with inappropriate monetary conditions. Domestic market is rather small and trade barriers are relatively high, consequently Azerbaijan gets also only 94th position out of 189 countries in World Bank Doing Business Ranking, Trade Across Borders, 2016. Banking sector is still underdeveloped (109 position out of 189 countries in World Bank Doing Business Ranking, Getting Credit, 2016).

9 World Bank. World Development Indicators 2014.

Georgia

Georgia attracts 25% of regional FDI. The foreign direct investment in Georgia is more efficiency seeking (cheaper labor resources and factory costs (taxes, trade barriers, transportation costs)). Georgia made an impressive progress in improving investment climate. According to the "Ease of doing business" indicator of World Bank, Georgia improved its position from 112 in 2005 to 24 in 2016[10]. Georgia is named as a corruption free country where rule of law has been given the right way based on Global Corruption Barometer indicator. Despite its small home market size, Georgia has the access to market of 900 mln. people without customs duties. Besides these progressive steps political stability still remains the main obstacle for foreign investors which is proved by Political Stability Index (lowest position in Europe with Ukraine and Russia). Political and economic stability was under serious question mark in 2008 when Georgia had a military conflict with its neighbor country – Russia. After the war Georgia is still trying to return to post war position as a stably growing secure economy.

Armenia

Armenia attracts only 7% of total regional foreign direct investments. Similar to Georgia, in Armenia investment is efficiency seeking rather than resource seeking as in Azerbaijan. Armenia made a significant progress toward liberalization of its economy after the breakup of the Soviet Union. Location is one of the crucial factor which makes Armenia a preferable destination for foreign investments because it provides an access to the former Soviet republics. Armenia with only 3 mln. population offers cheap labor force to foreign investors which is an additional advantage factor. Alongside with these advantages, corruption remains a significant obstacle to foreign investment. Government introduced number of reforms in the last few years against corruption, but in judiciary, tax and customs operations, health, education, and law enforcement areas corruption still remains as a huge problem. According to the Transparency International (TI) 2014 Corruption Perception Index (CPI) report, Armenia tied for rankings 94th among 176 countries. Another important obstacle for investors is unsolved conflict with Azerbaijan for Nagorno-Karabakh (Croissant (1998)).

In overall, the South Caucasus region with its natural resources and strategic location creates opportunities for foreign direct investments but unsolved conflicts, such as: Abkhazia, South Othetia and Nagorno-Karabakh, high level of corruption, political instability still appear to deteriorate investment climate in the South Caucasus region.

[10] World Bank. Doing Business 2016.

4.Data and model

4.1.Data

The primary data used in this study is BEEPS 2009 (Business Environment and Enterprise Performance Survey), collected in a joint project of the EBRD and the World Bank and covers 11 998 enterprises through 29 countries of Eastern Europe and Central Asia (including Kosovo)[11].

A typical problem of using survey data is possible survey respondents' perception bias (Kaufman and Wei (1999)). There are two possible sources of perception bias. One is country level perception bias. In some countries their citizens or firms may "complain" more than in other countries even face the same objective obstacles. Country level perception bias comes from different cultural norms or degree of political freedom. Second type of bias is linked to individual firm level. For example, some firms may subjectively provide positive or negative answer about political instability depending on their overall perception of the business climate. Assuming that the bias is uncorrelated among groups of respondents, individual perception bias affects only standard errors of estimates obtained from the survey responses.

Fries et al. (2003) checked such perception bias based on the BEEPS 2002 data by comparing measures obtained from the survey responses and objective measures and find no significant perception biases across the countries. If we assume that BEEPS 2009 follows a similar methodology as BEEPS 2002, we may conclude that perception bias will not affect our results (De Rosa et. al (2010)).

BEEPS assesses the local environment for private enterprises and business development. BEEPS sample is selected using stratified random sampling with three levels of stratification:

- Industry;
- Establishment size;
- Region.

In industry level three different sectors are represented: manufacturing, service and other services. Size stratification uses following coding: small (less than 19 permanent, full-time employees), medium (20 to 99 permanent, full-time employees), and large (more than 99 permanent, full-time employees).

BEEPS dataset has several advantages relative to the datasets used in previous studies, such as: cross-country panel data (Alesina and Perotti (1996), Alesina et al. (1996)). Most crucial advantage is that the BEEPS data enables us to extract valuable information about not only firm characteristics but also firms' perceptions about business environment, for example political stability, access to finance etc. in the country.

[11] We are using BEEPS 2009 instead of recent survey in 2014 because the BEEPS 20014 does not cover Azerbaijan.

After cleaning the data from outliers, we have 818 enterprises from South Caucasus region, more specifically 247 observations from Georgia, 306 - from Azerbaijan and 265 - from Armenia (Table 4 in Annex 1). Firms which are owned by private foreign individuals with a share more than 10% are classified as a foreign firm. From the whole sample (818 enterprises) 91% of firms are classified as a local and remaining 9% - foreign firm. Distribution of foreign firms by countries is the following: Georgia (24%), Azerbaijan (47%) and Armenia (29%).

Based on the sample 54% of firms are assumed as a small firm, 32% - medium size firm and 14% - large. 39% of whole foreign direct investments go to medium size firms, 33% - large firms and the least attractive is small size firms (28%) (Table 5 in Annex 1). Sample covers firms from 18 different industries (Table 6 in Annex 1). Most representative are enterprises from retail industry (34%), food (13%) and construction (13%). The structure of local and foreign firms by industry is similar. For foreign investors most attractive industries are: food (25% of whole FDI), retail (19%) and construction (8%). The distribution of foreign direct investment shows that 31% of foreign direct investments are full ownership (100%). This kind of investments are very often in Armenia (43%) and Azerbaijan (44%), but in case of Georgia the highest portion of FDIs (35%) come to 41-65% ownership.

Foreign and local firms in the South Caucasus region face many constraints in current operations. Based on the firms' perceptions, political instability is in top five major obstacles. The ranking of obstacles shows that there is no huge difference between ownership types. 11.1% of foreign firms assume political instability as a major obstacle for their current operations while 10.6% of local firms think so.

As a further control of perception bias we created two different specification of political instability. BEEPS collects information on self-reported measures of political instability. Specifically, firms are asked to report on a 0 ("No obstacle") to 4 ("very severe obstacle") scale, how problematic political instability is for the current operation. It is quite subjective what the distinction between categories is. On the other hand, such scale measure is the source of individual bias. To address to the problem, we created political instability dummy. It equals to 1 if political instability is indicated as a minor, moderate, major or very severe obstacle and 0 otherwise (De Rosa et. al (2010)).

Second specification comes from the country level bias. In order to control our estimates for such country effects we transformed the responses into binary responses, according to whether or not the response to each question is above or below the average country response (we follow the similar coding of obstacle variables as in Roller and Mohnena (2005) study). Table 8 in Annex 1 presents the correlations between three different specifications of political instability. It is visible that both specification are highly correlated with initial measure.

Another limitation of this data is that we measure country level variable, such as political instability, based on the firm level perception. So, it is important to check the relationship between our subjective and more objective country level political instability indices, such as:

- Political instability index by The Economist;
- Political Stability and Absence of Violence by World Bank.

Table 4 in Annex 3 shows the correlations between country average perception of political instability according to BEEPS data and two other political instability indices. Correlations between BEEPS and The Economist Index and BEEPS and WGI are not the same. This is quite logical because these two country level political instability indices are based on different methodologies. Correlation is higher in case of The Economist and equals to 0.42. Furthermore, after checking the ranking of the countries[12] based on these three different measures, rank test shows that there is no significant difference between ranking means that our subjective perception data gives the similar general picture as other more objective measures.

4.2.Model

Instead of classic FDI location studies which are based on the different possible locations of affiliates for each MNEs, this dissertation focuses on firms from only one region. In order to investigate the relationship between political instability and FDI we use two step (probit + truncated) model. On the first stage, estimated by probit model, we compute the probability for each firm to be foreign. If foreign ownership is less than 10% firm is assumed as a local (=0), otherwise foreign (=1). As a measure of foreign ownership we use the percent of the firm owned by private foreign individuals, companies or organization. Firm is foreign owned if a latent variable, FDI* is positive[13]. The explanatory variables of the probability that a firm is foreign or local are firm level information as well as firms' perception of investment climate constraints, including the perception of political instability.

$$FDI = 1 \; if \; FDI^* > 0$$

$$FDI = 0 \; otherwise$$

$$FDI^*_{ij} = b \times X_{ij} + c \times q_{ij} + \varepsilon_{ij} \qquad (1)$$

q_{ij} is the perception of political instability of firm i in j country. X_{ij} is a vector of other factors which determine the probability of being a foreign firm. $b \; and \; c$ are parameter vectors to estimate. We can call this equation as a "***propensity of receiving FDI***".

On the first stage, we try to answer the following questions: what are the characteristics of foreign owned firms and are there any country level obstacles which affect the propensity of FDI? Our data gives us opportunity to expand our analysis and explore the determinants of intensity of FDI. When firm has more than 10% of foreign share it is assumed as a foreign firm but what factors

[12] See Table 5 in Annex 3.

[13] Our data covers not only local firms which have some foreign share but also includes Greenfield investment with full foreign ownership. In case of Greenfield investment latent variable is always positive they started their operation as foreign firms. There are only 14 firms (out of 72 foreign firms) with Greenfield investment but they do not affect the general picture. In case of excluding this type of investment the sign and the significance of coefficients are the same.

determine the volume of such foreign share. Do firm level characteristics still play a crucial role or other country level factors determine it? To answer the mentioned questions we use a truncated regression (based on OLS).

$$Foreign\ share_{\ ij} = \gamma \times X_{ij} + \mu \times q_{ij} + \epsilon_{ij} \quad if\ 10\% < foreign\ ownership\ < 100\% \quad (2)$$

X is a vector of determinants other than political instability, γ is a parameter vector, μ is the parameter to estimate. This equation is denoted as a "***FDI intensity equation***".

Explanatory variables determine propensity/intensity of FDI are firm level information as well as affiliate firms' perception of investment climate constraints. In case of firm level characteristics we control affiliate firm's size, age, production diversification and productivity. Larger firms, measured by log of permanent full-time workers, have more resources; they can take more risk and therefore are more likely to be foreign owned (Blomström and Zejan (1991), Javorcik and Wei (2009), Gorodnichenko and Schnitzer (2010)). Age of the firm is the log of the number of years since the firm began operation in the country. There are two possible explanations: older firms already developed routines and are less likely to receive FDI. Another view is that older firms already accumulated huge knowledge which is additional motives for foreign headquarters to invest in this affiliate company. There is a prior evidence for both hypotheses (Gorodnichenko and Schnitzer (2010), Kinda (2010)).

Product diversification measured by "share of first largest product/service category in total sales" is another firm level characteristic which might affect firm's ownership type. Diversified firms are more likely to have a minority ownership and thus more likely to engage in joint ventures (Meyer (1998), Javorcik and Wei (2009)). Foreign owned firms tend to be more productive than domestically owned firms in transition countries (Blomstrom (1988), Haddad and Harrison (1993), Aitken and Harrison (1999)). To control such productivity we use the following measure - "sales per employee"[14]. Other crucial firm level variables which are expected to have a positive effect on attracting FDI are R&D dummy[15] and holding an internationally-recognized quality certificate.

Except political instability, we also use other country level characteristics. Table 9 in Annex 1 summarizes the most serious obstacles for the local and foreign firms. For affiliate firms top five country level obstacles are: access to finance, tax rates, and practice of competitors in informal sector, corruption and political instability. The last one is our interest variable. All these variables are based on firms' perceptions range from "no obstacle – 0" to "very severe obstacle – 4".

After making dummies from the perception of political instability we should follow the same technique for other country level control variables: tax rates, access to finance, corruption and competition to informal sector.

[14] We use such a broad measure of productivity instead of value added because of considerable amount of missing data.

[15] We use R&D dummy instead of intensity because of limitation of data.

Access to finance is the indicator of financial development. When financial sector is developed in the country this makes the credits cheaper and also supports country's economic performance which might have a possible link to propensity as well as intensity of FDI (Kinda (2010)). Desai et al. (2004b) found the evidence that indirect business taxes have a negative effect on FDI that is in the same range as corporate income taxes. Practices of competitors in informal sector and corruption are indirect costs which increases firm's operational expenditures and make the host county less attractive for foreign investors (Javorcik and Wei (2009), Kinda (2010)).

Based on the model described above, the central hypothesis that we seek to test are the following:

- Firms' perception of political instability discourages the probability of getting FDI, i.e., $c < 0$;
- Conditional on FDI taking place, political instability discourages FDI intensity, how much investment will be made in the region, i.e., $\mu < 0$, in the FDI intensity equation.

5.Empirical Results

Estimated regressions are based on propensity of FDI and intensity of FDI equations. According to the likelihood ratio test we reject Tobit against Probit + truncated model. Insignificant self-selectivity correction factor in Heckman model supports the argument that error terms in case of propensity of FDI equation and intensity of FDI equation are not correlated and we can use Probit + truncated as a main model. Unlinked first and second stage of the model comes from the fact that propensity of FDI is mostly determined by firm level characteristics while intensity of FDI is more country level specific.

Starting from a basic model (Table 1 in Annex 2) which includes firm level characteristics together with political instability shows that perception of political instability does not have a significant effect neither on propensity nor on intensity of FDI. On the other hand, the results correspond to the stylized fact that larger, younger and productive firms are more likely to be foreign owned. Holding internationally recognized quality certificate, as a non-intangible asset, plays a positive role in terms of propensity of FDI. The results are quite robust across different types of models.

Table 2 in Annex 2 summarizes the results of the model if we add other country level controls, such as: tax rates, corruption, access to finance and competition against informal sector. Similar to the basic model, large size and low age alongside with holding internationally recognized certificate are important characteristics of foreign firms. This result is robust in both specifications.

Perception of political instability has negative sign and is significant only in intensity equation. When affiliate firms' assume that political stability affects their current operations their

headquarters prefer to reduce their share by 31% because the risk of confiscation[16]. Other country level characteristics, such as: corruption, access to finance, informal sector and tax rates do not cause the risk of losing businesses. These variables just determine business environment in the country. If company is already in the market and faces these constraints it is not willing to increase investment but on the other hand there is no necessity to reduce it.

The effect of perception of corruption on propensity/intensity of FDI is unstable across the specifications. Only one country level variable which has significant effect on the first stage is tax rates. Despite subjective perceptions of obstacles we can assume that in case of tax rate these subjective perceptions is based on objective data. When company makes decision to enter or not to some country's market, it should take into account information about tax rates. So, perception of tax rates has significant negative effect on propensity of FDI. High tax rates hamper foreign investors. As a result, countries with high tax rates are less likely to attract FDI.

5.1.Robustness check of the empirical results

Different types of FDI (horizontal and vertical) have different motives and therefore face different constraints. Analysis of exporting and non-exporting firms gives us opportunity to evaluate the importance of political instability for each type of FDI. Based on the structure of ownership, foreign firms' decision to invest in a host country may differ. Instead of full ownership, MNEs may prefer a joint venture to reduce risk when investing in a foreign country.

According to the fact that significant amount of FDIs in the South Caucasus region go to oil industry it will be interesting to check how oil industry affects the general picture. Deeper analysis by sector gives us the possibility to evaluate how oil and non-oil firms perceive political instability and how such perceptions affect their investment decision.

Other checks of robustness are related to firm level characteristics: firm size and productivity. After excluded top 5% largest and productive firms, we will have a more detailed information how firm size and productivity affect the relationship between perception of political instability and propensity/intensity of FDI.

In addition, we want to check the possible perception bias based on the regional[17] average perceptions. The idea of regional average perception comes from the fact that political instability is a regional variable and mostly affected by regional characteristics (Petracco and Schweiger (2012)).

[16] Political instability is an action of national government which prevents business transaction or causes the confiscation of wholly or partially foreign owned business properties, Weston and Sorge's (1972).

[17] BEEPS covers the following regions in the South Caucasus region: Georgia – Tbilisi, Imereti, Kakheti, Kvemo Kartli, Mtskheta-Mtianeti, Shida kartli. Armenia – Yerevan, North, South – East, South – West. Azerbaijan – Baku & Apsherons, Aranski & Gorno – Shirvanski, Giandja-Kazakhski & Sheki-Zakatalski, Lenkoranski & Kuba-Khachmazski.

Breakdown by export status: Exporting versus non-exporting firms

Data gives us opportunity to test the difference of perceptions between local market and export oriented firms[18]. We are interested in which type of firms perceive political instability more problematic. We expect that local market oriented firms are more sensitive to political instability. These firms are less flexible to change location because their primary target market is a host country.

Based on the sub-sample of non-exporting firms (Table 4 in Annex 2, column 5) model shows that firms which concentrate mainly on host country market (horizontal FDI), hereafter HFDI and perceive political instability as an obstacle to current operation are less likely to make an investment. On the other hand, firms which already made an FDI they prefer to reduce the volume of investment by 45%. The reduction of investment in case of whole sample (exporting + non-exporting) was only 31%. These results give us the evidence to say that non-exporting firms are more sensitive to political instability than exporting firms.

Breakdown by ownership degree: joint-venture and foreign fully-owned firms

It is a stylized fact that most firms are risk averse especially when they make a decision of investment. Companies try to reduce uncertainty. One way to enter to a host market but partially avoid the risk is to find a local partner as a joint venture. Political instability is a source of uncertainty means that join venture investment is less sensitive to political instability than full ownership.

However, joint venture is a way of sharing the macroeconomic risks, such as: political instability but it arises the possible risk between ventures in decision making process. To avoid such within company risk, foreign ventures try to increase their share to make individual decision. So the trade-off between macro and micro risks are obvious.

The results based on only joint venture investment (Table 4 in Annex 2, column 2) correspond to our main results (Table 2 in Annex 2) in terms of sign and magnitude. This means that being a foreign joint venture does not solve the problem of uncertainty. Joint venture investments are as sensitive to political instability as the overall investments (joint venture + full ownership).

Table 3 in Annex 2 represents how the impact of political instability on average foreign share gradually decreases as foreign share gets low. On average, companies with high foreign share are more sensitive to political instability than companies with lower foreign share. This relationship is not monotonic. The idea of nonlinear relationship between perception of political instability and foreign share is depicted on the Chart 2 in Annex 2. Until some threshold of foreign share, firms are less sensitive to political instability. When the firm accumulates a considerable amount of

[18] Exporting firms are defined such a way =1 if direct + indirect export >10, =0 otherwise.

foreign investment, now it takes into account risk of political instability because the risk of confiscation.

Chart 1 in Annex 2 shows that in case of 40% of foreign owned companies the volume of foreign share is 86-100%; means that our main results (significant negative effect of political instability on foreign share) are mostly driven by companies with more than 86% of higher foreign share.

Breakdown by Oil and Non-oil sector

The oil[19] and gas sector had significant impact on the economy of Azerbaijan for several years and still continues to grow. Based on the data in 2008, the share of oil & gas industry in Azerbaijan FDI was 83.9%, on the other hand the share of Azerbaijan in total regional FDI was 61%. On its own oil industry has different patterns than non-oil industry especially when we investigate the foreign investment in this sector. Investment in oil industry strongly controlled by Production Sharing Agreements (PSA) (Ciarreta and Nasirov (2010)). There are different governmental procedures to get the PSA contract. First stage is negotiation between foreign company and SOCAR on the PSA terms. Then foreign firm submits the contract to several government departments for corrections. After that contract has to be ratified by parliament and the finally confirmation by the president. This long procedures arise the question that firms in oil industry is closely linked to government and investment in this sector could be more sensitive to political instability than in any other industry.

Column 1 of Table 4 in Annex 2 presents the results of our model in case of non-oil industries. Firms in non-oil industry prefer to reduce the volume of investment when they perceive political instability as an obstacle. This means that our main result is not only driven from the firms in oil-industry.

Firms in oil as well as in non-oil industry are sensitive to political instability in case of intensity of FDI but also oil resource itself has significant positive effect on foreign investment (Table 5 in Annex 2).

Breakdown by regions: checking perception bias

Some of the business environment aspects are mostly defined at the national level, such as: tax rates, access to finance, but on the other hand there are some factors, for instance, political instability, competition to informal sector, corruption, which can be influenced by the district/region (Petracco and Schweiger (2012)). Data gives us the opportunity to analyze political instability on the district level.

[19] See definition of oil industry in annex Table 1 in Annex 3.

Part 1 of Table 7 in Annex 2 presents average perception of obstacles in different regions. Heterogeneity of perceptions between regions in case of country level obstacles, such as, tax rates and access to finance arise the question of individual (regional) perception bias. For example, firms of region "Imereti" in Georgia have very negative perceptions in every type of obstacles, including tax rates and access to finance. To control such bias we follow our first specification. Part 2 of Table 7 in Annex 2 shows average perception of political instability in different regions based on the political instability dummy.

Table 6 in Annex 2 shows the results when we have regional average perception of political instability instead of individual firm level perception. In case of intensity of FDI, political instability is still significant impediment of FDI.

6.Complementarity between obstacles

Mix of different obstacles creates a business environment which somehow attracts or deters foreign investment. Government is a main player which set the rules, so it has all the possibilities to change the environment. All aspects of business climate are regulated by the government. So, stability of the government means the stability of the system. As a result, obstacles, such as tax rates, access to finance, informal sector and corruption seem to depend on the stability of the government.

Based on the definition of political instability (Root (1972)) it is an “additional cost” in terms of risk of losing of profit potential/assets in international business operations, due to government change. Similarly, corruption is also an “additional informal cost” which makes your business more costly. If company faces both obstacles together it might be more expensive to maintain the possible profit. So, foreign firms which search for the location to earn the highest profit such unstable and corrupted business environment will not be preferable.

Other combinations of obstacles, such as: political instability with tax rates and access to finance also arise the questions of complementarity. But in this case tax rates and access to finance are now “direct costs” which has to be paid and they are parts of business operations. So, there is no direct link how tax rate and access to finance reinforce the negative impact of political instability on intensity of FDI.

From its meaning, informal sector is a business environment with low-paid and poorly secure jobs. Competition against informal sector makes firm's costs relatively high. This is an opportunity cost of making business legally. In this case there is no obvious complementarity with political instability; in general cost that is not measure in terms of monetary units is not significantly taken into consideration.

Before econometric specification of complementarity we present descriptive evidence based on the count statistics. Table 8 in Annex 2 gives information about the frequency of occurrences of our 16 states in condition that political instability always holds. Frequency of occurrences is a better approach than a linear correlation because as we mentioned above in case of perception of political instability and corruption the relationship is non-monotonic. The first column shows all the possible combinations between obstacles. From Table 7 it is clear that all these five obstacles together is always most common. The problem of this multiple combination is a complicated calculation, more appropriate is to use pair-wise combinations (Topkis (1978)), such as: political instability and corruption. In case of pairwise complementarity, there are some interesting rules to consider. We are trying to identify impediments for foreign investment which means that we are searching for obstacles which are faced to foreign firms.

Third column of Table 8 in annex 2 shows that no foreign firms assume that political instability alone is an obstacle while political instability in line with corruption has 22.2% share. Similar dependence between these two obstacles also exists in oil industry. Frequency of 11000 is around twice higher than frequency of 10000. This kind of relationship is not a case for non-oil industry. The result is quite logical because oil industry is more sensitive to governmental activities, such as: political instability and corruption than other industries.

Table 8 in Annex 2 also draws some conclusions about high productive and low productive firms. In case of pairwise comparison it is clear that for high productive firms political instability together with finance (10100) is more frequent (7%) than any other pairwise combinations. But low productive firms still face political instability and corruption together.

In overall, descriptive statistics give us the first sign that perception of political instability and corruption might be linked but still there is a question how they reinforce or weaken each other's effects. This arises the necessity to turn to a more systematic approach, which further controls for other exogenous factors. Now we can define complementarity in FDI decision formally by checking whether the FDI function is supermodular[20] in obstacles. Testing complementarity is the same as checking the supermodularity. We have to check the following hypothesis:

$$H_0 : h_0 < 0 \qquad \text{[Test 1 – strict Supermodularity]}$$

$$H_1 : h_0 \geq 0$$

Where $h_0 = s_{10} + s_{01} - s_{00} - s_{11}$. This is a test for strict supermodularity. The test accepts H_0 whenever the constraint is negative. Rejection the null hypothesis does not imply that the two obstacles are substitutes, because H_1 includes also the case of equality ($h_0 = 0$).

[20] Detailed methodology see in Annex 3 – Checking the supermodularity.

Table 1. Check of complementarity

	Political instability and Corruption		Political instability and Finance		Political instability and Tax rates		Political instability and Informal Sector	
	Propensity	Intensity	Propensity	Intensity	Propensity	Intensity	Propensity	Intensity
t - test								
I stage								
$H_0 : h_0 = 0$	H0		H0	H0	H0	H0	H0	H0
$H_1 : h_0 =/ 0$		H1						
P values	0.427	0.008	0.783	0.242	0.699	0.777	0.931	0.162
II stage								
$H_0 : h_0 > 0$		H0						
$H_1 : h_0 < 0$								
P values		0.995						

Table 1 presents two stage t-test for inequality constraint. First stage shows simple check of linear equality ($s_{10} + s_{01} = s_{00} + s_{11}$). Based on this test we can't conclude that there is either complementarity or substitutability between perception of political instability and perception of the following obstacles, tax rates, access to finance and informal sector. But possible relationship between perception of political instability and corruption is still valid. The second stage gives the answer to this question that perception of corruption weakens the significant negative impact of perception of political instability in intensity of FDI. So, there is a lack of complementarity between perception of political instability and corruption.

Table 9 in Annex 2, column 2 indicates that when affiliate company perceives political instability as an obstacle to current operation headquarter prefers to reduce investment but on the other hand when affiliate faces high corruption together with political instability parent company is indifferent in investment decision. Joint effect of political instability and corruption do not have a significant effect on intensity of investment. These results are consistent with the conclusion of Fredriksson and Svensson (2002). Table 11 in Annex 2 shows the marginal effects of political instability on intensity of FDI. When firms perceive that corruption is not an obstacle marginal effect of political instability is negative and significant while in case of corruption the effect of political instability on FDI is not significantly different from zero. So, corruption is not necessarily bad for MNEs in unstable environments. More specifically, when firms perceive that there is an unstable political environment in the country they are less willing to pay bribes because the life horizon of existing government is limited. If the company does not pay bribes it means that company is free from this informal tax, such as bribe. On the other hand, political instability still remains as an obstacle and is an additional informal cost. So, we have two opposite effects, because of political instability we eliminate negative effect of corruption but political instability itself is a problem and negatively affects FDI. This is the reason why the joint effect of political instability and corruption on FDI is ambiguous, it is insignificant.

Results based on structural model are the logical extension of the conclusions of descriptive statistics. We know that in most cases when firm perceive political instability as an obstacle they also face high corruption, but these two obstacles do not strengthen but neutralize each other's individual negative effects. If we link our results to U shape relationship between corruption and political stability (Chart 1 in Annex 3) we can assume that Armenia with high political instability and also high corruption is in preferable condition than Azerbaijan because this high instability covers the negative effect of high corruption. Georgia maintains middle position with low level of corruption and not a significant instability. If we extend our analysis in the whole region we know that overall effect of perception of political instability in intensity of FDI is negative.

We have to point out one important limitation of such complementarity check. Our results are based on the perception data and it is difficult to say what are the direct effects of political instability and corruption because both of them are strongly affected by the institutional development of the country. Moreover, due to the small number of foreign firms in the sample we can't check how sensitive this result is if we exclude some sector or firms from the analysis. This means that further studies based on the high quality data will be beneficial.

7.Conclusion

Foreign direct investment is a major source of competition between developing countries. This paper investigates how perception of investment climate constraints deteriorate FDI attractiveness in the South Caucasus region. For investment climate constraint, this paper focuses on perception of political instability as an obstacle of current operation. Using firm level data about perception of different obstacles, the result shows that when affiliate company perceives political instability as an obstacle it does not have a significant effect on headquarters' decision invest or not in the South Caucasus region but on the other hand headquarters which already made a FDI in this region are willing to reduce the volume of investment because the risk of confiscation.

A breakdown analysis between oil and non-oil firms shows that perception of political instability has significant negative effect on inward FDI not only in oil but also in non-oil industries. On the other hand, oil resource itself plays a significant positive role in intensity of FDI. Non-exporting firms are more sensitive to political stability than exporting ones. Checking complementarity between obstacles shows that institutional development factors, such as political instability and corruption mostly occurred together but political instability neutralizes the negative effect of corruption. This means that in addition to its own negative effect political instability has also a positive effect in improving business environment through compensates the negative effect of corruption. In the South Caucasus region the overall effect of political instability on FDI is mostly dominated by negative direct of political instability. This means that relative to corruption political instability is more serious obstacle for the firms and the region should take a step to stabilize political environment if it wants to attract more FDI and encourages higher economic growth.

When discussing about the results we should take into account that using firm level data has its own advantages but also it characterizes with some limitations. The perception data is a source of

measurement errors. This can lead to endogeneity problem; instrumental variable technique will be a good proxy to assign this problem (kinda (2000)). Another method to address the problem is simultaneous equations system (Alesina and Perotti (1992)). Political instability affects FDI inflows but on the other hand foreign direct investment improves socio-economic stability in the country.

Weakness of the perception data is also that it includes many variables explaining the same phenomena. This may arise the problem of multicolinearity. One possible solution is to create an aggregate index of countries' institutional development, include this in regression and check the effect of general institutional development on propensity/intensity of FDI. If further research is related to address these limitations it will be very fruitful.

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Annex 1
Descriptive statistics

Table 1. Description of variables

Variable name	Variable description	BEEPS question
Firm level characteristics		
Foreign share	Private foreign individuals, companies or organizations	What percent of this firm is owned by each of the following: 1.Private domestic individuals, companies or organizations; 2.Private foreign individuals, companies or organizations 3.Government/State 4.Other
R&D	Invested in research and development (in-house or outsourced) in last 3 years?	In fiscal year 2007, did this establishment spend on research and development activities, either in-house or contracted with other companies (outsourced)?
Product diversification	First product/service, percent of total annual sales	What percentage of total sales does the main product represent?
Log (Firm size)	No. permanent, full-time employees of this firm at end of last fiscal year	At the end of fiscal year 2007, how many permanent, full-time employees did this establishment employ? Please include all employees and managers
Log (Productivity)	Sales per worker	In last fiscal year, what were this establishment's total annual sales? no. permanent, full-time employees of this firm at end of last fiscal year
Log(age)	Firm's age	Year of survey minus the year when the firm was established. For the year established: In what year did your firm begin operations in this country?
Certificate	Internationally-recognized quality certification	Does establishment have an internationally-recognized quality certification?

Perception of obstacles		
Political instability	Obstacle to the current operations : political instability	1. No obstacle 2. Minor obstacle 3. Moderate obstacle 4. Major obstacle 5. Very Severe obstacle 6. Do not know* 7. Does not apply*
Corruption	Obstacle to the current operations : corruption	
Tax rates	Obstacle to the current operations : tax rates	
Access to finance	How much of an obstacle is: access to finance	
Informal sector	How much of an obstacle are the informal sector competitors to your operations?	

In our data there are 10% of missing values. So, responses "Do not know" and "Does not apply" are counted as “No obstacle”. But if we drop them, the results are similar to the main results in terms of sign and magnitude of the estimators. For example, in case of political instability it has negative sign with magnitude 30.0 and significant on 10% level. In our main model the coefficient of political instability is -31.4. This means that our results are quite robust despite such specification.

Table 2. Correlation matrix

	Foreign share	R&D	Product diversification	Log (Productivity)	Log (Firm size)	Log(age)	Certificate	Political instability	Access to finance	Corruption	Tax rates	Informal sector
Foreign share	1.000											
R&D	0.035	1.000										
Product diversification	-0.002	-0.052	1.000									
Log (Productivity)	0.186	0.271	-0.084	1.000								
Log (Firm size)	0.020	0.178	-0.144	-0.046	1.000							
Log(age)	-0.075	0.017	-0.062	0.264	-0.189	1.000						
Certificate	0.248	0.177	-0.008	0.373	0.098	0.059	1.000					
Political instability	-0.005	0.163	-0.105	0.039	0.342	-0.121	0.083	1.000				
Access to finance	-0.064	0.014	-0.071	-0.097	0.068	0.036	-0.076	0.138	1.000			
Corruption	0.016	0.043	-0.164	-0.029	0.095	-0.017	0.020	0.283	0.266	1.000		
Tax rates	-0.111	-0.011	-0.041	-0.053	0.073	0.033	-0.045	0.199	0.290	0.180	1.000	
Informal sector	-0.014	0.095	-0.159	-0.084	0.116	0.019	-0.030	0.121	0.325	0.268	0.289	1.000

Table 3. Descriptive Statistics

Variables	Number of observations	Mean	St. Dev
Firm level characteristics			
Foreign share	818	6.088	21.341
R&D	818	0.131	0.337
Product diversification	818	87.123	18.563
Log (Firm size)	818	3.060	1.275
Log (Productivity)	818	11.452	3.072
Log(age)	818	2.314	0.706
Certificate	818	0.200	0.401
Perception of obstacles			
Political instability	818	1.570	1.536
Corruption	818	1.462	1.411
Tax rates	818	1.899	1.316
Access to finance	818	1.622	1.375
Informal sector	818	1.571	1.481

Table 4. Distribution of firms across countries*

	Foreign Ownership		
	0	1	
Georgia	230	17	247
Azerbaijan	272	34	306
Armenia	244	21	265
South Caucasus	746	72	818

Table 5. Distribution of firms by size*

Firm size	Foreign ownership		
	0	1	
Small (5-19)	424	20	444
Medium (20-99)	232	28	260
Large (>=100)	90	24	114
Total	746	72	818

*Firm with more than 10% owned by foreign individuals/companies is defined as - Foreign firm.

Table 6. Distribution of firms by industry

Industry	Foreign ownership		Total
	0	1	
Retail	35%	19%	34%
Food	12%	25%	13%
Construction Section	13%	8%	13%
Other Manufacturing	7%	6%	7%
Transport Section	7%	6%	7%
Hotel And Restaurants	6%	7%	6%
Wholesale	4%	3%	4%
Other Services	3%	0%	3%
Non Metallic Mineral	3%	3%	3%
Basic Metals	2%	1%	2%
Textiles	1%	4%	2%
Fabricate Metal Production	1%	3%	2%
Machinery And Equipment	1%	4%	1%
Chemicals	1%	4%	1%
Garments	1%	0%	1%
It	0%	4%	1%
Electronics	0%	3%	1%
Plastics & Rubber	1%	0%	0%

Table 7. Country average perceptions of different obstacles

	Political instability	Access to finance	Corruption	Tax rates	Informal sector
Armenia	2.287	1.747	1.679	2.091	1.894
Azerbaijan	0.569	1.533	1.676	1.771	1.536
Georgia	2.040	1.599	0.964	1.850	1.267
South Caucasus	1.570	1.622	1.462	1.899	1.571

Table 8. Correlation between three different specifications of political instability

	Initial measure	Specification 1	Specification 2
Initial measure	1.000		
Specification 1	0.855	1.000	
Specification 2	8.845	0.687	1.000

Table 9. The most serious obstacles in the region*

most serious obstacle	South Caucasus region	
	Local Firms	Foreign Firms
Access to finance	22.30%	25.90%
Tax rates	20.60%	14.80%
Practice of competitors in informal sector	14.50%	13.00%
Corruption	8.50%	11.10%
Political instability	10.60%	11.10%
Inadequately educated workforce	2.60%	5.60%
Tax administration	5.20%	5.60%
Transport	2.60%	3.70%
Access to land	1.30%	1.90%
Business licensing and permits	1.50%	1.90%
Crime, theft and disorder	1.50%	1.90%
Customs and trade regulations	4.50%	1.90%
Electricity	2.60%	1.90%
Courts	1.00%	0.00%
Labor regulations	0.80%	0.00%

* We exclude responses “don’t know” and “does not apply”

Annex 2

Empirical results

Table 1. Comparison of models (OLS, Tobit, Heckman , probit+truncated).

			Heckman			
	OLS	Tobit	Selection	Model	Probit	Truncated
R&D	-2.321	-39.592	-0.349	10.855	-0.349	-1.042
	(-0.898)	(-1.359)	(-1.506)	(-0.647)	(-1.562)	(-0.049)
Product diversification	0.002	0.409	0.003	-0.286	0.003	-0.525
	(-0.05)	(-0.678)	(-0.72)	(-1.124)	(-0.694)	(-1.318)
Log (Firm size)	2.850***	42.773***	0.353***	-8.138	0.353***	-0.207
	(-3.745)	(-4.766)	(-4.95)	(-0.597)	(-5.606)	(-0.031)
Log (Productivity)	1.300**	24.142***	0.195***	-3.867	0.195***	0.017
	(-2.31)	(-3.388)	(-3.079)	(-0.442)	(-3.764)	(-0.002)
Log(age)	-4.181***	-61.850***	-0.499***	12.055	-0.499***	6.067
	(-3.951)	(-3.950)	(-3.962)	(-0.601)	(-4.251)	(-0.484)
Certificate	9.444***	80.176***	0.673***	-26.753	0.673***	-6.795
	(-3.176)	(-3.206)	(-4.017)	(-0.998)	(-3.775)	(-0.436)
Political Instability						
Minor obstacle	-3.001	-44.467	-0.396	-8.849	-0.396	-36.741
	(-1.442)	(-1.281)	(-1.333)	(-0.460)	(-1.448)	(-1.246)
Moderate obstacle	1.602	34.267	0.292	-25.314*	0.292	-0.599
	(-0.59)	(-1.075)	(-1.231)	(-1.685)	-1.157	(-0.026)
Major obstacle	-0.885	-14.122	-0.086	-14.157	-0.086	-19.391
	(-0.406)	(-0.458)	(-0.363)	(-1.371)	(-0.358)	(-1.231)
Very severe obstacle	0.049	-1.025	-0.115	4.2	-0.115	-28.198
	(-0.018)	(-0.030)	(-0.443)	(-0.34)	(-0.436)	(-1.234)
Constant	-6.331	-458.711***	-3.657***	184.458	-3.657***	87.738
	(-0.880)	(-3.992)	(-4.000)	(-0.947)	(-4.642)	(-0.772)
Country dummies	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES
sigma		133.586***				23.452***
		(-7.868)				(-5.162)
lambda			-28.364			
			(-0.549)			

*Note. The parentheses contain the t -statistics. * Significance at the 10% level. ** Idem., 5%. ****

Table 2. Model with additional country level controls (marginal effects are presented)

	Specification 1		Specification 2	
	Propensity of FDI	Intensity of FDI	Propensity of FDI	Intensity of FDI
R&D	-0.054*	-22.506	-0.047	-8.795
	(-1.893)	(-0.994)	(-1.617)	(-0.434)
Product diversification	0.000	-0.351	0	-0.383
	(-0.623)	(-0.775)	(-0.502)	(-1.244)
Log (Firm size)	0.044***	5.695	0.042***	-0.353
	(-5.322)	(-0.732)	(-5.159)	(-0.054)
Log (Productivity)	-0.001	-2.294	0.002	0.379
	(-0.166)	(-0.791)	(-0.623)	(-0.143)
Log(age)	-0.062***	7.339	-0.061***	5.379
	(-4.384)	(-0.528)	(-4.193)	(-0.397)
Certificate	0.090***	-9.441	0.087***	-12.855
	(-4.189)	(-0.746)	(-4.063)	(-0.825)
Political instability	-0.032	-31.986*	-0.025	-31.436*
	(-1.599)	(-1.807)	(-1.289)	(-1.793)
Corruption	0.044**	-5.589	0.019	2.466
	(-2.167)	(-0.475)	(-0.942)	(-0.149)
Tax rates	-0.054***	-10.833	-0.035*	-7.564
	(-2.738)	(-0.872)	(-1.713)	(-0.363)
Informal sector	0.004	-11.509	-0.004	-7.346
	(-0.198)	(-0.868)	(-0.216)	(-0.458)
Access to finance	0.002	13.625	-0.001	-9.576
	(-0.108)	(-0.935)	(-0.035)	(-0.463)
Industry dummies	YES	YES	YES	YES
Sigma		24.731***		24.336***
		(-4.631)		(-4.41)

*Note. The parentheses contain the t -statistics. * Significance at the 10% level. ** Idem., 5%. *** Idem., 1%.*

Table 3. Model with different quintiles of foreign share (99%, 95%, 90%, 75%)

	Foreign share (99 quantile)		Foreign share (95 quantile)		Foreign share (90 quantile)		Foreign share (75 quantile)	
	Propensity	Intensity	Propensity	Intensity	Propensity	Intensity	Propensity	Intensity
R&D	-0.053**	-28.416	-0.057**	-24.607*	-0.049*	-18.684*	-0.031	2.256
	(-1.996)	(-1.515)	(-2.140)	(-1.767)	(-1.933)	(-1.719)	(-1.455)	(-0.222)
Product diversification	0.000	-0.087	0.000	-0.190	0.000	-0.062	0.000	-0.025
	-0.601	(-0.326)	(-0.452)	(-0.898)	(-0.427)	(-0.418)	(-0.782)	(-0.172)
Log (Firm size)	0.033***	8.439	0.031***	2.755	0.029***	1.78	0.023***	-4.577*
	-4.349	(-1.247)	(-4.203)	(-0.579)	-4.04	(-0.458)	(-3.416)	(-1.685)
Log (Productivity)	0.001	-1.787	0.001	-0.412	0.000	-1.240	0.002	-0.474
	-0.231	(-0.737)	(-0.362)	(-0.211)	(-0.030)	(-0.723)	(-0.782)	(-0.238)
Log(age)	-0.048***	-2.539	-0.050***	-6.828	-0.049***	-11.763**	-0.028***	-0.438
	(-3.788)	(-0.230)	(-3.868)	(-0.882)	(-3.844)	(-1.974)	(-2.603)	(-0.076)
Certificate	0.066***	-6.911	0.068***	1.04	0.063***	3.354	0.042**	-7.428*
	-3.494	(-0.633)	(-3.685)	(-0.159)	(-3.426)	(-0.664)	(-2.472)	(-1.765)
Political instability	-0.027	-37.491**	-0.026	-27.462***	-0.018	-17.961**	-0.01	-5.933
	(-1.521)	(-2.529)	(-1.509)	(-2.919)	(-1.073)	(-2.415)	(-0.694)	(-0.860)
Corruption	0.036**	-7.542	0.030*	-11.950*	0.024	-15.071***	0.029**	-5.426
	-2.083	(-0.748)	(-1.812)	(-1.819)	(-1.521)	(-2.621)	(-1.961)	(-1.472)
Tax rates	-0.026	-15.539	-0.023	-9.446	-0.020	-8.712	-0.021	-1.198
	(-1.498)	(-1.448)	(-1.381)	(-1.144)	(-1.216)	(-1.139)	(-1.436)	(-0.089)
Informal sector	-0.007	-10.084	-0.007	-7.159	-0.007	-0.039	-0.009	1.137
	(-0.370)	(-0.929)	(-0.384)	(-0.886)	(-0.389)	(-0.007)	(-0.597)	(-0.197)
Access to finance	-0.004	21.150*	-0.003	16.604*	0.002	13.325*	0.001	-0.994
	(-0.223)	(-1.681)	(-0.157)	(-1.801)	(-0.105)	(-1.796)	(-0.062)	(-0.104)
Industry dummies	YES	YES	YES	YES	YES	YES	YES	YES
Sigma		21.731***		16.263***		13.248***		9.291***
		(-4.894)		(-5.728)		(-6.007)		(-4.133)

*Note. The parentheses contain the t -statistics. * Significance at the 10% level. ** Idem., 5%. *** Idem., 1%.*

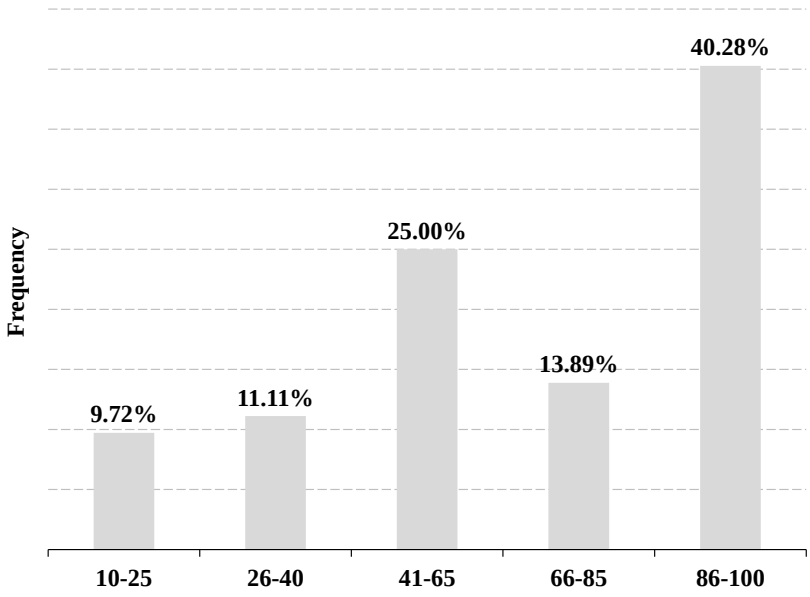

Chart 1. Distribution of foreign share

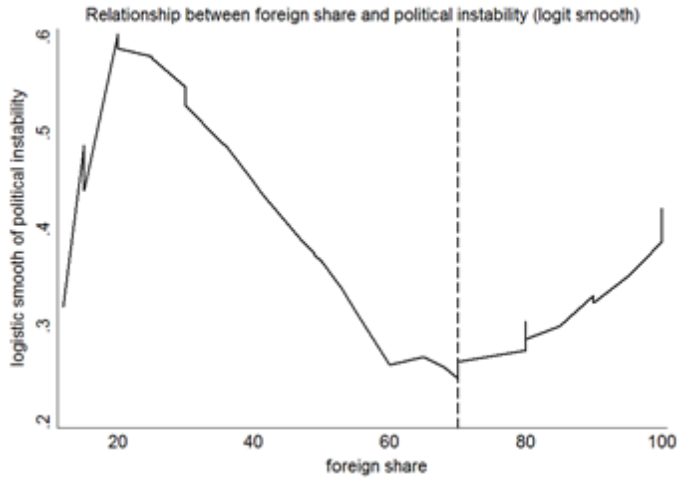

Chart 2. Relationship between foreign share and political instability (all foreign firms)

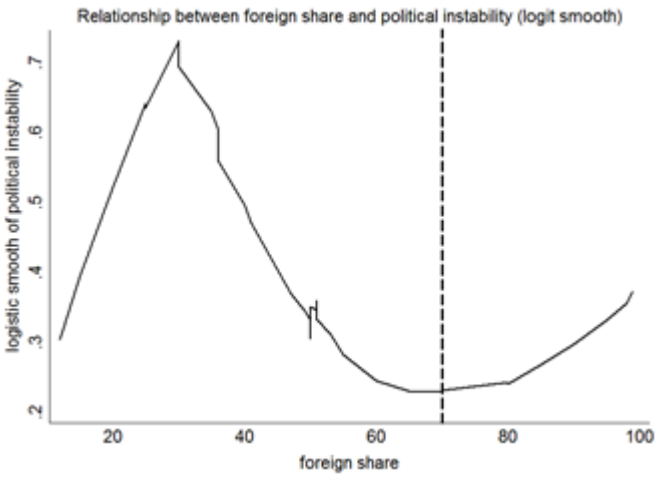

Chart 3. Relationship between foreign share and political instability (only joint venture, excluding full ownership)

Table 4. Robustness check with different specifications

	Non - Oil industry		Joint Venture		Size of the Firm (without top 5%)		Productivity of the Firm (without top 5%)		Non-exporting Firm	
	Propensity	Intensity	Propensity	Intensity	Propensity	Intensity	Propensity	Intensity	Propensity	Intensity
R&D	-0.057*	-26.507	-0.055**	-22.506	-0.045	-36.263	-0.065**	-13.123	-0.018	-58.917***
	(-1.845)	(-1.256)	(-2.040)	(-0.994)	(-1.642)	(-1.315)	(-2.170)	(-0.548)	(-0.710)	(-2.580)
Product diversification	0.001	-0.097	0.000	-0.351	0.000	0.152	0.000	-0.406	0.000	-0.029
	(-1.631)	(-0.265)	(-0.491)	(-0.775)	(-0.719)	(-0.53)	(-0.541)	(-0.817)	(-0.169)	(-0.055)
Log (Firm size)	0.052***	8.387	0.033***	5.695	0.051***	16.368*	0.048***	3.518	0.036***	21.550***
	(-5.648)	(-1.112)	(-4.389)	(-0.732)	(-5.167)	(-1.793)	(-5.708)	(-0.426)	(-4.618)	(-2.62)
Log (Productivity)	-0.001	-2.086	0.000	-2.294	-0.001	-1.804	-0.002	-1.077	-0.001	-3.75
	(-0.228)	(-0.721)	(-0.129)	(-0.791)	(-0.185)	(-0.593)	(-0.598)	(-0.352)	(-0.319)	(-1.300)
Log(age)	-0.060***	-2.303	-0.045***	7.339	-0.059***	13.414	-0.064***	12.549	-0.055***	22.968
	(-3.923)	(-0.182)	(-3.459)	(-0.528)	(-4.222)	(-1.024)	(-4.495)	(-0.923)	(-3.940)	(-1.326)
Certificate	0.098***	-11.588	0.064***	-9.441	0.091***	-20.005*	0.081***	-7.307	0.096***	-25.287**
	(-4.204)	(-0.823)	(-3.322)	(-0.746)	(-4.358)	(-1.901)	(-3.643)	(-0.503)	(-4.61)	(-2.034)
Political instability	-0.03	-32.187*	-0.022	-31.986*	-0.021	-34.669**	-0.028	-29.461*	-0.036*	-45.915**
	(-1.384)	(-1.802)	(-1.252)	(-1.807)	(-1.115)	(-2.060)	(-1.430)	(-1.639)	(-1.819)	(-2.028)
Corruption	0.048**	-8.057	0.040**	-5.589	0.049**	3.676	0.049**	-13.391	0.043**	3.569
	(-2.178)	(-0.662)	(-2.293)	(-0.475)	(-2.44)	(-0.345)	(-2.412)	(-0.950)	(-2.127)	(-0.306)
Tax rates	-0.058***	-13.004	-0.029*	-10.833	-0.062***	-19.691*	-0.059***	-15.819	-0.050**	-16.116
	(-2.755)	(-0.992)	(-1.683)	(-0.872)	(-3.136)	(-1.697)	(-3.019)	(-1.112)	(-2.556)	(-1.539)
Informal sector	0.014	-7.317	-0.008	-11.509	0.000	-22.392*	0.011	-10.304	0.020	-32.161**
	(-0.642)	(-0.559)	(-0.477)	(-0.868)	(-0.021)	(-1.660)	(-0.568)	(-0.716)	(-1.046)	(-1.967)
Access to finance	0.004	19.751	-0.007	13.625	0.008	21.114	0.000	22.081	-0.011	37.841**
	(-0.178)	(-1.25)	(-0.403)	(-0.935)	(-0.399)	(-1.632)	(-0.002)	(-1.333)	(-0.580)	(-2.546)
Industry dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
sigma		22.714***		24.731***		20.332***		24.969***		18.894***
		(-4.542)		(-4.631)		(-5.853)		(-4.433)		(-5.955)

*Note. The parentheses contain the t -statistics. * Significance at the 10% level. ** Idem., 5%. *** Idem., 1%.*

Table 5. Model – political instability interaction with oil dummy

	Propensity of FDI		Intensity of FDI	
	beta	margins	beta	margins
	baseline (0 0) - no political instability and no oil			
0 1	-0.403		26.197	
	(-0.963)		-1.537	
1 0	-0.243		-40.334*	
	(-1.482)		(-1.936)	
1 1	-0.565		20.573	
	(-1.432)		(-0.628)	
Political instability		-0.028		-36.792*
		(-1.518)		(-1.917)
Oil		-0.04		38.947*
		(-1.369)		(-1.867)
R&D	-0.428*	-0.053*	-14.948	-14.948
	(-1.869)	(-1.867)	(-0.665)	(-0.665)
Product diversification	0.003	0.000	-0.495	-0.495
	(-0.683)	(-0.68)	(-1.229)	(-1.229)
Log (Firm size)	0.360***	0.045***	5.188	5.188
	(-5.537)	(-5.382)	-0.749	-0.749
Log (Productivity)	0.00	0.00	-3.599	-3.599
	(-0.132)	(-0.132)	(-1.054)	(-1.054)
Log(age)	-0.482***	-0.060***	8.238	8.238
	(-4.182)	(-4.159)	(-0.602)	(-0.602)
Certificate	0.734***	0.091***	-2.527	-2.527
	(-4.218)	(-4.242)	(-0.199)	(-0.199)
corruption	0.365**	0.045**	-3.315	-3.315
	(-2.236)	(-2.231)	(-0.295)	(-0.295)
tax	-0.429***	-0.053***	-13.741	-13.741
	(-2.713)	(-2.705)	(-1.201)	(-1.201)
informal	0.023	0.003	-5.728	-5.728
	(-0.148)	(-0.148)	(-0.475)	(-0.475)
finance	0.004	0.001	18.348	18.348
	(-0.027)	(-0.027)	(-1.342)	(-1.342)
Constant	-1.660**		100.628*	
	(-2.279)		(-1.672)	
sigma				23.378***
				(-4.863)

*Note. The parentheses contain the t -statistics. * Significance at the 10% level. ** Idem., 5%.*

Table 6. Model with regional average perception of political instability

	Propensity	Intensity
R&D	-0.049*	0.748
	(-1.725)	(0.032)
Product diversification	0.001	-0.220
	(0.892)	(-0.708)
Log (Firm size)	0.044***	0.182
	(5.396)	(0.027)
Log (Productivity)	0.003	1.674
	(0.792)	(0.571)
Log(age)	-0.063***	-0.700
	(-4.620)	(-0.066)
Certificate	0.087***	-21.026
	(4.006)	(-1.334)
Political instability	-0.079**	-62.039**
	(-2.420)	(-2.134)
Informal sector	0.005	-3.546
	(0.233)	(-0.289)
Corruption	0.036*	-6.426
	(1.813)	(-0.566)
Access to finance	0.000	2.006
	(0.022)	(0.146)
Tax rates	-0.055***	-5.737
	(-2.842)	(-0.442)
Industry dummies	YES	YES
sigma		24.313***
		(4.754)

*Note. The parentheses contain the t -statistics. * Significance at the 10% level. ** Idem., 5%. *** Idem., 1%.*

Table 7. Regional average perception of obstacles

	Part I					Part 2
	Political instability	Corruption	Tax	Informal sector	Access to finance	Political instability specificatin 1
Georgia						
Tbilisi	2.197	0.746	1.493	0.986	1.239	0.831
Imereti	2.255	2.255	2.553	2.468	2.723	0.957
Kakheti	1.776	0.429	1.633	0.837	1.102	0.612
Kvemo Kartli	2.125	0.625	2.000	1.750	1.500	0.625
Mtskheta-Mtianeti	1.348	0.739	1.043	0.565	1.217	0.609
Shida Kartli	2.184	0.735	2.265	1.204	1.735	0.755
Armenia						
Yerevan	2.407	1.934	2.054	2.168	1.790	0.838
North	3.051	0.950	2.750	1.150	1.800	0.900
South-East	1.538	1.231	1.673	1.173	1.365	0.673
South-West	2.423	1.500	2.654	2.154	2.192	0.923
Azerbaijan						
Baku & Apsherons	0.890	1.729	1.519	1.160	1.072	0.398
Aranski & Gorno-Shirvanski	0.159	1.477	2.091	2.364	2.091	0.068
Giandja-Kazakhski & Sheki-Zakatalski	0.036	1.764	2.236	1.800	2.273	0.018
Lenkoranski & Kuba-Khachmazski	0.154	1.462	2.000	2.192	2.231	0.115

Table 8. Co – occurrence matrix between obstacles

	Total	Local	Foreign	Oil industry	Non Oil industry	More productive firms	Less productive firms
10000	5.7%	6.2%	0.0%	8.5%	5.1%	3.5%	9.0%
10001	5.4%	5.5%	3.7%	6.8%	5.1%	4.0%	7.5%
10010	2.4%	2.6%	0.0%	1.7%	2.5%	3.0%	1.5%
10011	4.5%	4.9%	0.0%	6.8%	4.0%	2.5%	7.5%
10100	5.1%	4.2%	14.8%	1.7%	5.8%	7.0%	2.3%
10101	5.7%	5.9%	3.7%	8.5%	5.1%	4.0%	8.3%
10110	1.8%	2.0%	0.0%	1.7%	1.8%	2.0%	1.5%
10111	5.7%	6.2%	0.0%	8.5%	5.1%	8.0%	2.3%
11000	7.8%	6.5%	22.2%	13.6%	6.5%	4.0%	13.5%
11001	6.0%	5.9%	7.4%	6.8%	5.8%	5.0%	7.5%
11010	3.6%	3.3%	7.4%	0.0%	4.4%	4.5%	2.3%
11011	4.5%	4.2%	7.4%	0.0%	5.5%	5.5%	3.0%
11100	4.2%	4.6%	0.0%	1.7%	4.7%	5.0%	3.0%
11101	8.4%	9.1%	0.0%	6.8%	8.7%	7.0%	10.5%
11110	10.2%	9.4%	18.5%	11.9%	9.8%	14.9%	3.0%
11111	19.2%	19.5%	14.8%	15.3%	20.0%	20.4%	17.3%

*All combinations have the following order:

1. Political instability;
2. Corruption;
3. Access to finance;
4. Competition to informal sector;
5. Tax rates;

So, combination 10000 means that only political instability is an obstacle.

**Productive is a binary variable. =1 higher than regional median productivity, =0 otherwise.

Table 9. Complementary check

	Political instability and Corruption		Political instability and Finance		Political instability and Tax rates		Political instability and Informal Sector	
	Propensity	Intensity	Propensity	Intensity	Propensity	Intensity	Propensity	Intensity
Q00	-0.196**	-24.53	-0.192**	90.569	-0.200**	77.605	-0.195**	75.636
	(-2.188)	(-0.470)	(-2.097)	(-1.469)	(-2.196)	(-1.262)	(-2.167)	(-1.212)
Q01	-0.162*	-73.076	-0.194**	86.365	-0.248***	70.258	-0.190**	51.993
	(-1.856)	(-1.309)	(-2.107)	(-1.355)	(-2.769)	(-1.046)	(-2.179)	(-0.78)
Q10	-0.246***	-162.227**	-0.229**	34.392	-0.225**	50.595	-0.225**	29.965
	(-2.701)	(-2.055)	(-2.489)	(-0.482)	(-2.457)	(-0.753)	(-2.463)	(-0.44)
Q11	-0.183**	-69.673	-0.221**	75.877	-0.287***	34.217	-0.224**	45.222
	(-2.017)	(-1.253)	(-2.289)	(-1.17)	(-3.025)	(-0.5)	(-2.433)	(-0.651)
R&D	-0.052*	-6.797	-0.054*	-17.439	-0.054*	-21.587	-0.054*	-17.686
	(-1.850)	(-0.364)	(-1.892)	(-0.796)	(-1.902)	(-0.936)	(-1.893)	(-0.820)
Product diversification	0.000	0.188	0.000	-0.455	0.000	-0.3	0.000	-0.247
	(-0.688)	(-0.368)	(-0.608)	(-1.055)	(-0.674)	(-0.674)	(-0.621)	(-0.530)
Log (Productivity)	0.000	2.011	-0.001	-2.941	0.000	-2.43	-0.001	-2.235
	(-0.151)	(-1.079)	(-0.191)	(-1.042)	(-0.148)	(-0.855)	(-0.155)	(-0.926)
Log (Firm size)	0.044***	17.217**	0.044***	6.643	0.044***	5.538	0.044***	5.36
	(-5.33)	(-2.34)	(-5.322)	(-0.84)	(-5.31)	(-0.697)	(-5.324)	(-0.694)
Log(age)	-0.062***	-4.354	0.091***	-2.175	0.090***	-10.318	0.090***	-8.845
	(-4.374)	(-0.492)	(-4.199)	(-0.187)	(-4.198)	(-0.788)	(-4.19)	(-0.779)
Certificate	0.089***	-25.110**	-0.063***	11.511	-0.062***	7.151	-0.062***	8.213
	(-4.168)	(-1.994)	(-4.358)	(-0.785)	(-4.356)	(-0.525)	(-4.397)	(-0.643)
Corruption			0.045**	4.688	0.043**	-6.154	0.044**	-8.17
			(-2.213)	(-0.302)	(-2.143)	(-0.516)	(-2.174)	(-0.709)
Access to finance	0.004	31.778**			0.001	12.625	0.002	6.433
	(-0.214)	(-2.009)			(-0.073)	(-0.792)	(-0.108)	(-0.469)
Tax rates	-0.053***	-11.004	-0.053***	-2.749			-0.054***	-5.497
	(-2.692)	(-1.010)	(-2.725)	(-0.257)			(-2.740)	(-0.476)
Informal Sector	0.003	-27.850*	0.004	-17.663	0.004	-11.034		
	(-0.157)	(-1.805)	(-0.192)	(-1.218)	(-0.206)	(-0.818)		

*Note. The parentheses contain the t -statistics. * Significance at the 10% level. ** Idem., 5%. *** Idem., 1%.*

Table 10. Interaction between perception of political instability and corruption

*Note. The parentheses contain the t -statistics. * Significance at the 10% level. ** Idem., 5%. *** Idem., 1%.*

	Intensity
Political instability and corruption	141.101***
	(-2.636)
Political instability	-137.698***
	(-2.882)
Corruption	-48.546**
	(-2.161)
R&D	-6.797
	(-0.364)
Product diversification	0.188
	(-0.368)
Log (Firm size)	17.217**
	(-2.34)
Log (Productivity)	2.011
	(-1.079)
Log(age)	-4.354
	(-0.492)
Certificate	-25.110**
	(-1.994)
Tax rates	-11.004
	(-1.010)
Informal sector	-27.850*
	(-1.805)
Access to finance	31.778**
	(-2.009)
Constant	-24.53
	(-0.470)
Industry dummies	YES
Sigma	19.703***
	(-5.854)

Table 11. Marginal effect of political instability

Political instability	Marginal effects
Corruption - 0	-137.697***
	(-2.88)
Corruption - 1	3.403
	(-0.25)
Overall	-54.189***
	(-2.89)

Table 12. Marginal effect of corruption

Corruption	Marginal effects
Political - 0	-48.546**
	(-2.16)
Political - 1	92.554***
	(2.73)
Overall	3.287
	(0.38)

Annex 3

Methodology description

Table 1. Definition of oil industry[21]

Desctiption	Isic code Rev.3.1	Number of Firms
Gas-Distributing System Service	5260	5
Sale Of Liquefied Gas	5259	3
Liquefied Gas	5259	
Gas Sales	5251	5
Gas. Lpg	5251	
Public Gas Service	5251	
Sale Of Gas	5219	6
Liquified Gas	5219	
Selling Of Liquefied Gas	5190	16
Solid, Liquid And Gas Fuels.	5190	
Sales Of Liquefied Hydrocarbon Gas	5141	3
Sale And Delivery Of Liquified Gas	5141	
Gas Sales	5141	
Gas Retail	5141	
Gasoline	5141	
Sale Of Liquefied Gas	5050	16
Selling Gas Fuel	5050	
Liquid Oil Gas	5050	
Trade Of Gaseous Fuels	5050	
Motor Fuel (Liquefied Gas)	5050	
Construction Of Gas Supply	4520	67
Building Of Oil And Gas Constructions	4520	
High Voltage Gas	3190	1
Gas Cocks	2899	5
Liquid And Gas Oxigen	2429	2
Technical Gas, Production	2429	
Manufacturing And Trading Of Technical Gases And Gas Mixtures	2411	1

[21] United nations statistics division.

Worldwide Governance Indicator

Political Stability and Absence of Violence/Terrorism

Political Stability and Absence of Violence/Terrorism measure perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. This table lists the individual variables from each data sources used to construct this measure in the Worldwide Governance Indicators Representative Sources.

Table 2. Political Stability and Absence of Violence/Terrorism (WGI)

EIU	GCS	HUM	IJT	IPD	PRS	WMO
Orderly transfers	Cost of Terrorism	Political terror scale	Security Risk Rating	Intensity of internal conflicts	Government stability	Protests and riots
Armed conflict				Intensity of violent activities	Internal conflict	Terrorism
Violent demonstrations				Intensity of social conflicts	External conflict	Interstate war
Social Unrest					Ethnic tensions	Civil war
International tensions / terrorist threat						

EIU - Economist Intelligence Unit Riskwire & Democracy Index

GCS - World Economic Forum Global Competitiveness Report

HUM - Cingranelli Richards Human Rights Database and Political Terror Scale

IJT - iJET Country Security Risk Ratings

IPD - Institutional Profiles Database

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PRS - Political Risk Services International Country Risk Guide

WMO - Global Insight Business Conditions and Risk Indicato

The Economist measure of political instability

The overall index on a scale of 0 (no vulnerability) to 10 (highest vulnerability) has two component indexes—an index of underlying vulnerability and an economic distress index. The overall index is a simple average of the two component indices. There are 15 indicators in all—12 for the underlying and 3 for the economic distress index.

Table 3. The Economist Intelligent Unit

Underlying vulnerability	Economic distress
Inequality	Growth in income
State history	Unemployment
Corruption	level of income per head
Ethnic fragmentation	
Trust in institution	
Status of minorities	
History of political instability	
Proclivity of labour unrest	
Level of social provision	
A country's neighbourhood	
Regime type	
Regime type and factionalism	

Table 4. Cross country correlation between three different measures of political instability

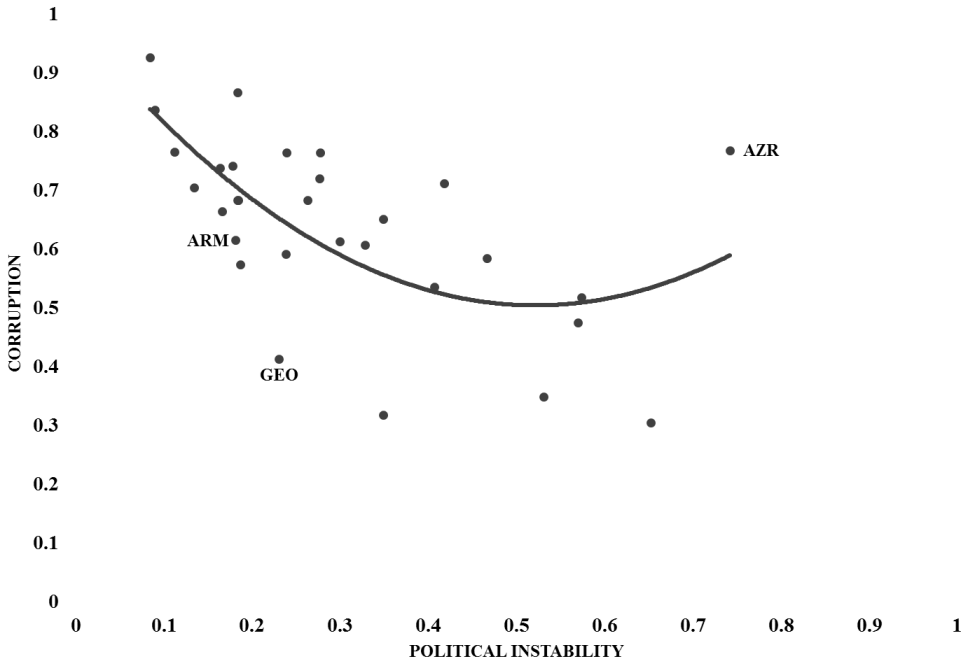
	BEEPS	The Economist	WGI
BEEPS	1.000		
The Economist	0.422	1.000	
WGI	0.259	0.640	1.000

In case of BEEPS measure we use country average perceptions. In total we have 30 countries.

Table 5. Country ranking based on three different measures of political instability

	BEEPS 2009		The Economist		Worldwide Governance indicators	
Ranking	Country	Index	Country	Index	Country	Index
1	Ukraine	2.7	Ukraine	7.6	Turkey	3.5
2	Turkey	2.5	Bosnia and Herze	7.5	Tajikistan	3.5
3	Armenia	2.3	Moldova	7.5	Uzbekistan	3.5
4	Albania	2.2	Kyrgyz Republic	7.1	Russia	3.5
5	Latvia	2.2	Tajikistan	7.1	Georgia	3.4
6	Bosnia and Herze	2.2	Turkey	6.8	Bosnia and Herze	3.2
7	Serbia	2.2	Estonia	6.7	Kyrgyz Republic	3.1
8	Kyrgyz Republic	2.1	Latvia	6.7	Moldova	3.1
9	Lithuania	2.1	Fyr Macedonia	6.6	Serbia	3.0
10	Hungary	2.1	Russia	6.5	Ukraine	2.8
11	Poland	2.1	Montenegro	6.4	Azerbaijan	2.8
12	Georgia	2.0	Romania	6.4	FYR Macedonia	2.8
13	Russia	2.0	Serbia	6.4	Albania	2.6
14	Moldova	1.9	Georgia	6.3	Armenia	2.3
15	Romania	1.8	Uzbekistan	6.3	Bulgaria	2.2
16	Mongolia	1.8	Albania	6.2	Latvia	2.2
17	Czech Republic	1.7	Croatia	6.1	Romania	2.1
18	Bulgaria	1.6	Hungary	6.1	Belrus	2.0
19	Fyr Macedonia	1.6	Lithuania	6.1	Hungary	2.0
20	Slovak Republic	1.5	Mongolia	6.1	Estonia	2.0
21	Kazakhstan	1.4	Bulgaria	6.0	Croatia	1.9
22	Estonia	1.4	Armenia	5.8	Lithuania	1.9
23	Tajikistan	1.3	Slovak Republic	5.5	Mongolia	1.9
24	Croatia	1.3	Azerbaijan	5.2	Kazakhstan	1.8
25	Belarus	1.2	Belarus	4.8	Montenegro	1.7
26	Uzbekistan	0.9	Kazakhstan	4.8	Czech Republic	1.6
27	Slovenia	0.8	Poland	4.5	Slovak Republic	1.6
28	Montenegro	0.6	Slovenia	3.8	Slovenia	1.6
29	Azerbaijan	0.6	Czech Republic	3.7	Poland	1.6

Chart 1. Relationship between political stability* and corruption



*Political stability is measured as " 4 – political instability".

Perception of political instability and corruption are averaged by country.

Chart 1 corresponds the argument of U shape relationship between political stability and corruption based on 30 countries[22]. If we analyze only South Caucasus region we see the heterogeneity between countries (Georgia, Armenia, and Azerbaijan). Azerbaijan and Armenia are two extreme points in the U shape curve. Demand effect dominants in Azerbaijan which cause that we have high stability together with high corruption. But in case of Armenia, horizon effect is the leading force, low stability associates with high corruption. Among these three countries Georgia characterizes as a stable country in terms of political stability and corruption. These diversified effects across countries do not show a clear picture about the whole region.

[22] Whole sample of BEEPS 2009 data.

Checking the supermodularity

Definition: If C_j' and C_j'' are two elements in the obstacle set. FDI propensity/intensity function $F(C_j;\theta_{ij})$ is supermodular if and only if $F(C_j';\theta_{ij}) + F(C_j'';\theta_{ij}) \leq F(C_j' \Delta C_j';\ \theta_{ij}) + F(C_j' \nabla C_j'';\ \theta_{ij})$. (Milgrom and Roberts (1990)).

A Simple Example:

A simple example might be useful for illustrative purposes. Let's assume that we have two binary decision variables, which implies that the set of all possible combination consists of four elements C ={{00};{01}{10};{11}}. For example, {00} shows that firms do not face either political instability or corruption. Using the above definition of supermodularity implies that there is only one nontrivial inequality constraint $I(10) + I(01) \leq I(00) + I(11)$ which show that the sum of individual effects is not higher than the simultaneous effect.

Testing complementarity is the same as checking the supermodularity. First step to test the inequality constraints and also the complementarity, we need consistent estimates of the effects of obstacles on FDI propensity ($\hat{s}_{ij}$) / intensity ($\tilde{s}_{ij}$). As we mentioned above FDI propensity/intensity function depends on several country level obstacles as well as other firm level characteristics.

$$F = \sum_{i=0}^{1}\sum_{j=0}^{1} Q_{ij} \times s_{ij} \times (\gamma \times W) + (\mu \times q) + \epsilon$$

Where Q00, Q10, Q01, Q11 show all possible pairs of obstacles. This equation is without constant term.

If two policies are complement the following inequality holds,

$$s_{10} + s_{01} \leq s_{00} + s_{11}$$

When we already know the consistent estimates of s_{ij} we can use the test for complementarity. We have to check the following hypothesis:

$$H_0 :\ h_0 < 0 \qquad \text{[Test 1 – strict Supermodularity]}$$

$$H_1 :\ h_0 \geq 0$$

Where $h_0 = s_{10} + s_{01} - s_{00} - s_{11}$. This is a test for strict supermodularity. The test accepts H_0 whenever the constraint is negative. Rejection the null hypothesis does not imply that the two obstacles are substitutes, because H_1 includes also the case of equality ($h_0 = 0$).

Consistent estimates of the parameters s_{ij} are obtained by estimating probit + truncated model. We use the estimates of $\hat{s}_{ij}$ and $\tilde{s}_{ij}$ to calculate the tests of complementarity for both propensity of FDI (through $\hat{s}_{ij}$) as well as the intensity of FDI (through $\tilde{s}_{ij}$).

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